

Applicant : Shumpei Yamazaki, et al.  
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051002 / US4976/4978/4981/4982D1

### Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

### Listing of Claims

1. (Currently amended) A thin film transistor comprising:  
at least a channel forming region in a crystalline semiconductor film comprising silicon,  
wherein an orientation ratio of a lattice plane {101} of the crystalline semiconductor film  
is not smaller than 20%, and the lattice plane {101} ~~[[having]]~~ has an angle of not larger than 10  
degrees with respect to a surface of the crystalline semiconductor film,  
wherein an orientation ratio of a lattice plane {001} of the crystalline semiconductor film  
is not larger than 3%, and the lattice plane {001} ~~[[having]]~~ has an angle of not larger than 10  
degrees with respect to a surface of the crystalline semiconductor film, ~~[[; and]]~~  
wherein an orientation ratio of a lattice plane {111} of the crystalline semiconductor film  
is not larger than 5%, and the lattice plane {111} has an angle of not larger than 10 degrees with  
respect to a surface of the crystalline semiconductor film, and  
wherein the lattice plane {101}, {001} and {111} are detected by an electron backscatter  
diffraction pattern method.

2. (Currently amended) A thin film transistor comprising:  
at least a channel forming region in a crystalline semiconductor film comprising silicon,  
wherein an orientation ratio of a lattice plane {101} of the crystalline semiconductor film  
is not smaller than 5%, and the lattice plane {101} ~~[[having]]~~ has an angle of not larger than 5  
degrees with respect to a surface of the crystalline semiconductor film,  
wherein an orientation ratio of a lattice plane {001} of the crystalline semiconductor film  
is not larger than 3%, and the lattice plane {001} ~~[[having]]~~ has an angle of not larger than 10  
degrees with respect to a surface of the crystalline semiconductor film, ~~[[; and]]~~

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wherein an orientation ratio of a lattice plane {111} of the crystalline semiconductor film is not larger than 5%, and the lattice plane {111} [[having]] has an angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film, and [[:]]

wherein the lattice [[plane]] plane {101}, {001} and {111} are detected by an electron backscatter diffraction pattern method.

3. (Previously Presented) The thin film transistor of claim 1, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration smaller than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration smaller than  $1 \times 10^{19}/\text{cm}^3$ .

4. (Previously Presented) The thin film transistor of claim 2, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration smaller than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration smaller than  $1 \times 10^{19}/\text{cm}^3$ .

5. (Previously Presented) The thin film transistor of claim 1, wherein the crystalline semiconductor film comprises germanium at a concentration not less than 0.1 atomic % but not greater than 10 atomic %.

6. (Previously Presented) The thin film transistor of claim 2, wherein the crystalline semiconductor film comprises germanium at a concentration not less than 0.1 atomic % but not greater than 10 atomic %.

7. (Previously Presented) The thin film transistor of claim 5, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

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8. (Previously Presented) The thin film transistor of claim 6, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

9. (Previously Presented) A transistor according to claim 1,  
wherein the crystalline semiconductor film comprises a metal element at a concentration less than  $1 \times 10^{17}/\text{cm}^3$ .

10. (Currently amended) A transistor according to claim 1,  
~~wherein~~ wherein the crystalline semiconductor film comprises at least a metal element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

11. (Currently amended) A transistor according to claim 1,  
~~wherein~~ wherein the crystalline semiconductor film has a thickness in a range of 20 to 100 nm.

12-18. (Canceled)

19. (Original) A transistor according to claim 1,  
wherein the crystalline semiconductor film comprises hydrogen or a halogen element.

20. (Currently amended) A semiconductor device comprising:  
at least a channel forming region in a crystalline semiconductor film comprising silicon,  
wherein an orientation ratio of a lattice plane {101} of the crystalline semiconductor film is not smaller than 20%, and the lattice plane {101} ~~[[having]]~~ has an angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film,  
wherein an orientation ratio of a lattice plane ~~{101}~~ {001} of the crystalline semiconductor film is not larger than 3%, and the lattice plane ~~{101}~~ {001} ~~[[having]]~~ has an

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angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film, ~~[[; and]]~~

wherein an orientation ratio of a lattice plane {111} of the crystalline semiconductor film is not larger than 5%, and the lattice plane {111} ~~[[having]]~~ has an angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film, and ~~[[;]]~~

wherein the lattice ~~[[plane]]~~ plane {101}, {001} and {111} are detected by an electron backscatter diffraction pattern method.

21. (Currently amended) A semiconductor device comprising:

at least a channel forming region in a crystalline semiconductor film comprising silicon, wherein an orientation ratio of a lattice plane {101} of the crystalline semiconductor film is not smaller than ~~[[20%]]~~ 5%, and the lattice plane {101} ~~[[having]]~~ has an angle of not larger than ~~[[10]]~~ 5 degrees with respect to a surface of the crystalline semiconductor film,

wherein an orientation ratio of a lattice plane ~~{101}~~ {001} of the crystalline semiconductor film is not larger than 3%, and the lattice plane ~~{101}~~ {001} ~~[[having]]~~ has an angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film, ~~[[; and]]~~

wherein an orientation ratio of a lattice plane {111} of the crystalline semiconductor film is not larger than 5%, and the lattice plane {111} ~~[[having]]~~ has an angle of not larger than 10 degrees with respect to a surface of the crystalline semiconductor film, and ~~[[;]]~~

wherein the lattice ~~[[plane]]~~ plane {101}, {001} and {111} are detected by an electron backscatter diffraction pattern method.

22. (Previously Presented) The semiconductor device of claim 20, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

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23. (Previously Presented) The semiconductor device of claim 21, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

24. (Previously Presented) The semiconductor device of claim 20, wherein the crystalline semiconductor film comprises germanium at a concentration not less than 0.1 atomic % but not greater than 10 atomic %.

25. (Previously Presented) The semiconductor device of claim 21, wherein the crystalline semiconductor film comprises germanium at a concentration not less than 0.1 atomic % but not greater than 10 atomic %.

26. (Previously Presented) The semiconductor device of claim 24, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

27. (Previously Presented) The semiconductor device of claim 25, wherein the crystalline semiconductor film comprises nitrogen and carbon each at a concentration less than  $5 \times 10^{18}/\text{cm}^3$ , and oxygen at a concentration less than  $1 \times 10^{19}/\text{cm}^3$ .

28. (Previously Presented) A device according to claim 20, wherein the crystalline semiconductor film comprises a metal element at a concentration less than  $1 \times 10^{17}/\text{cm}^3$ .

29. (Original) A device according to claim 20,  
wherein the crystalline semiconductor film comprises at least a metal element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

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30. (Original) A device according to claim 20,  
wherein the crystalline semiconductor film has a thickness in a range of 20 to 100 nm.

31-37. (Canceled)

38. (Original) A device according to claim 20,  
wherein the crystalline semiconductor film comprises hydrogen or a halogen element.

39. (Previously Presented) A transistor according to claim 2,  
wherein the crystalline semiconductor film comprises a metal element at a concentration  
less than  $1 \times 10^{17}/\text{cm}^3$ .

40. (Original) A transistor according to claim 2,  
wherein the crystalline semiconductor film comprises at least a metal element selected  
from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

41. (Original) A transistor according to claim 2,  
wherein the crystalline semiconductor film has a thickness in a range of 20 to 100 nm.

42. (Original) A transistor according to claim 2,  
wherein the crystalline semiconductor film comprises hydrogen or a halogen element.

43-79. (Canceled)

80. (Previously Presented) A device according to claim 21,  
wherein the crystalline semiconductor film comprises a metal element at a concentration  
less than  $1 \times 10^{17}/\text{cm}^3$ .

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81. (Original) A device according to claim 21,  
wherein the crystalline semiconductor film comprises at least a metal element selected  
from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu and Au.

82. (Original) A device according to claim 21,  
wherein the crystalline semiconductor film has a thickness in a range of 20 to 100 nm.

83. (Original) A device according to claim 21,  
wherein the crystalline semiconductor film comprises hydrogen or a halogen element.

84-120. (Canceled)

121. (Original) A device according to claim 20,  
wherein the semiconductor device comprises one selected from the group consisting of a  
cell phone, a video camera, a mobile computer, a portable data terminal, a TV receiver, a  
portable notebook, a personal computer, a player using a recording medium recording a program,  
a digital camera, a front-type projector and a rear-type projector.

122. (Original) A device according to claim 21,  
wherein the semiconductor device comprises one selected from the group consisting of a  
cell phone, a video camera, a mobile computer, a portable data terminal, a TV receiver, a  
portable notebook, a personal computer, a player using a recording medium recording a program,  
a digital camera, a front-type projector and a rear-type projector.

123-132. (Canceled)